

EDITORIALS.

IT HAS SEEMED to the writer that two lines of botanical research, much cultivated at the present time, are in danger of sterility. The two lines referred to are the conventional cytology and **Cytology and Physiology** physiology. The danger lies not in these great subjects, but in the narrow lines along which they are being cultivated. In the cytological field, by the use of various killing fluids and stains, investigators are obtaining various appearances. Aside from those well authenticated cell structures which have long been matters of common observation, these appearances are remarkably diverse, judging from the records of competent observers. Each investigator sees in his own facts a sequence of events, every step of which is necessarily an inference, no matter how reasonable it may seem to him. Enough has been observed to indicate that the maze of appearances that may be obtained from cell manipulation may not represent normal and constant phases of cell activity. It is certainly evident that the testimony obtained is ambiguous, for very numerous theories of cell operations may find support from observation, and in no field of investigation is it more true that one may find what he seeks. It is possible, therefore, that the mechanical cataloguing of these appearances may not be the most important direction of cytological investigation.

THERE IS NO THOUGHT to minify work that has been done, but rather to magnify the larger field that awaits cultivation. It seems reasonable to suppose that the fundamental principles of cell operations are comparatively few and simple. This would accord with all that has yet been discovered of fundamental principles. These same principles, however, may express themselves with a vast variety of detail, dependent upon conditions. Cytology is now concerning itself with this vast variety of detail, which of itself would seem to indicate that it is not fundamental, but dependent upon conditions. It would seem logical, therefore, with the details at hand, to direct investigation towards the conditions which determine these results. The

study of the effects of varying conditions upon the production of the various phases of cell activity would seem to be the fertile direction of cytology at present. Certain it is that through such investigations only will an approach be made to the fundamental principles. Such investigation has far more direct bearing upon the great problems of variation and heredity than any amount of examination of cell materials and of inference as to their relationships.

IN REFERENCE to the conventional physiology the same general statements are appropriate. Instead of attacking large problems, much of the work is advancing along purely mechanical lines in the record of isolated details. In other words, the outlying and endless details of expression of a few underlying principles are being catalogued, important enough in a way, but merely an incident in the progress of the real physiology. The fundamental problems are brought into view from the ecological standpoint. There is need of a renaissance of physiology, for there has been a long period of sterility. The founders of modern plant physiology are being followed in the mechanical phases of their work rather than in their fructifying ideas.